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| 10/591,014 | 05/14/2007 | Hiroyasu Kikukawa | 2007-0714 | 4764 |

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| EXAMINER | |
|---|---|
| JACOBSON, MICHELE LYNN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1794 | |

| NOTIFICATION DATE | DELIVERY MODE |
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| 03/17/2010 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/591,014 | KIKUKAWA, HIROYASU | |
| | Examiner | Art Unit | |
| | MICHELE JACOBSON | 1794 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/30/08, 6/11/08, 8/29/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation “An elastic member having exceptional release properties”. It unclear how good the “release properties” of the elastic member would need to be in order to be considered “exceptional”. Therefore, one of ordinary skill in the art would not be reasonably apprised of the full scope and breadth of the invention claimed. Claims 2-13 are rejected as being dependent from indefinite claim 1.

4. Claim 9 recites the limitation “wherein the base layer is composed of a metal or heat-resistant resin”. It is unclear what level of heat resistance would be required for a resin comprising the base layer to be considered “heat resistant”. Therefore, one of ordinary skill in the art would not be reasonably apprised of the full scope and breadth of the invention claimed in claim 9.

### *Claim Objections*

5. Claim 10 is objected to because of the following informalities: Claim 10 recites “the above base layer”. There is antecedent basis for the term “base layer” in claim 1

and therefore it would be more correct to refer to the base layer as “said base layer” as opposed to reciting "the above base layer" Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3, 5, 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikukawa et al. U.S. Patent No. 5,954,910 (hereafter referred to as Kikukawa) and Chen et al. U.S. Patent No. 6,113,830 (hereafter referred to as Chen).

8. Kikukawa teaches an elastic fixing roll comprising (a) a release surface material comprising porous polytetrafluoroethylene (PTFE) which has its pores impregnated with cross-linked synthetic rubber, and (b) an elastic porous body material of synthetic rubber foam; wherein the release surface material is adhered to the outer surface of the elastic porous body material by bonding of portions of the synthetic rubber of the release material to contacting portions of the synthetic rubber of the elastic porous body material. (Col. 2, lines 42-51) The thickness of the release surface is recited to be between 3 and 1000 μm. (Col. 4, lines 61-64)

9. The porous PTFE layer is recited to be produced by impregnating the porous PTFE film with uncured synthetic rubber, which is then cured. (Col. 5, lines 27-29) The fixing roll may be formed by first impregnating the porous PTFE film with uncured

silicone rubber or fluorosilicone rubber in liquid form and then wrapping the impregnated film onto a roll formed of an elastic porous body base material. After wrapping this film on the base material cross linking is initiated. (Col. 6, lines 19-30)

10. Kikukawa is silent regarding providing a PTFE fluororesin film over the porous PTFE film recited.

11. Chen teaches a fuser (i.e. fixing) roll member comprising, in order, a support; a fluoroelastomer layer; and a fluoropolymer resin layer directly on said fluoroelastomer layer. The method of making the coated fuser members is disclosed to comprise the steps of applying to a support a fluoroelastomer layer; applying to the fluoroelastomer layer a fluoropolymer resin powder; and sintering the fluoropolymer resin powder to form a fluoropolymer resin layer. (Col. 2, lines 9-16) The fluoroelastomer layer can comprise materials such as PTFE. (Col. 3, lines 50-56) The fluoropolymer resin layer comprises sintered fluororesin powder such as PTFE. (Col. 6, lines 25-30) The thickness of the fluoropolymer resin layer can be from 25 to 50 μm.

12. Chen also teaches that fuser rolls with a single compliant rubber layer absorb release oils and degrade in a short time leading to wrinkling artifacts, non-uniform nip width and toner offset. (Col. 1, lines 35-42) The provision of a fluoropolymer resin layer on such rolls solves these problems and provides a layer with good non-adhesiveness to toner and abrasion resistance. (Col. 2, lines 17-19)

13. Both Kikukawa and Chen are directed to fixing rolls comprising fluoroelastomer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided a sintered fluoropolymer resin layer as disclosed

by Chen on the elastic porous PTFE layer recited by Kikukawa prior to filling the layer with elastomer in order to prevent wrinkling artifacts, non-uniform nip width and toner offset. The obvious disposition of such a layer would have produced the same invention as claimed in claims 1-3, 5, 6, 7, 8-12.

14. Regarding claims 1 and 13: Chen teaches that "sintering of the fluoropolymer resin layer is usually accomplished by heating the coated fuser member to temperatures of approximately 500°C. Such high temperatures can have a detrimental effect on the silicone rubber layer causing the silicone rubber to smoke or depolymerize, which decreases the durability of the silicone rubbers and the adhesion strength between the silicone rubber layers and the fluoropolymer resin layer". (Col. 1, lines 50-57) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the sintered fluororesin layer prior to filling the porous PTFE layer of Kikukawa with elastomer since the material of the porous PTFE layer would have been expected to bond more favorably with the PTFE powder material for forming the sintered layer and this order of operations would have prevented degradation of the silicone rubber. This obvious modification of Kikukawa with Chen would have produced a roll as claimed in claim 1 produced by the same method as claimed in claim 13.

15. Regarding claims 2, 3, 5 and 6: Sintering is interpreted to read on thermal bonding as claimed in claim 2. Chen recites PTFE for the release layer as claimed in claim 3. Kikukawa recited a porous PTFE layer filled with silicone rubber as claimed in claims 5 and 6.

16. Regarding claim 8: The porous PTFE layer of Kikukawa is disclosed to be between 3 and 1000 μm. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

17. Regarding claims 9-12: The elastic porous body material of synthetic rubber foam recited by Kikukawa is interpreted to read on "heat resistant resin as claimed in claim 9. Kikukawa recites a fuser roll with is roll shaped and would be obviously used as a toner fixing element in a fixing device as claimed in claims 10-12.

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikukawa et al. U.S. Patent No. 5,954,910 (hereafter referred to as Kikukawa) and Chen et al. U.S. Patent No. 6,113,830 (hereafter referred to as Chen) and Oyama et al. WO 03/056396, U.S. Patent Application Publication No. 2005/0064122 used herein for reference (hereafter referred to as Oyama).

20. Kikukawa and Chen teach what has been recited above but are silent regarding providing the PTFE resin layer in the form of a thin densified PTFE film.

21. Oyama teaches a fluororesin film suitable for the surface layer of a fixing roll or a fixing belt wherein the film has a thickness of 20 μm or less and is made of densified PTFE. (Para. 13-18) The maximum layer thickness of the dense PTFE film is recited to be between 5 and 30 μm when it is used as the release layer for a fixing roll. (Para. 69) The surface roughness of a tube produced from the film of Oyama is recited to be less than 0.2 μm. If the surface roughness of 0.5 μm or higher the release properties of the toner become insufficient. (Para. 66)

22. Kikukawa, Chen and Oyama are all directed towards fixing rolls comprising fluoropolymers. The surface roughness of the sintered polymer layer of Chen is recited to be 1.6 μm. (table 1) Chen discloses the utility of providing a PTFE resin layer in order to prevent wrinkling artifacts, non-uniform nip width and toner offset for elastomer based fuser rolls. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the densified PTFE film disclosed by Oyama to provide a release layer capable of preventing wrinkling artifacts, non-uniform nip width and toner offset. The material recited by Oyama would have provided the additional benefit of decreased roughness compared to the PTFE layer recited by Chen.

23. The invention of Kikukawa provided with a densified PTFE film 5 to 30 μm thick as taught by Oyama and motivated by Chen would have produced the same invention as claimed in claims 4 and 7.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELE JACOBSON whose telephone number is (571)272-8905. The examiner can normally be reached on Monday-Thursday 8:30 AM-7 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michele L. Jacobson
Examiner /M. J./
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